

MAY 9, 1921

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AVIATION

AND
AIRCRAFT JOURNAL



Forest Fire Photographed from an Army Airplane

VOLUME X
Number 19

Four
Dollars
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SPECIAL FEATURES

PARAGRAPH 13, N.A.C.A. REPORT TO PRESIDENT
WHAT THE WEATHER BUREAU DOES FOR AIR PILOTS

BRITISH AIR POWER AND AIR POLICY

WHO'S WHO IN AMERICAN AERONAUTICS

AIRPLANE CRASHES—ENGINE TROUBLES

THE GARDNER, MOFFAT CO., INC.

HIGHLAND, N. Y.

225 FOURTH AVENUE, NEW YORK

RECEIVED
MAY 12 1921

FIELD OFFICERS SCHOOL
LANGLEY FIELD, VA

SPEED

Does it mean anything to you to save time?

Why do you travel by motor-car rather than by horse and buggy? Why the telephone?

Have you in mind a city which you visit often? Some city, say, only two hundred miles distant on the map, but eight or ten hours away by smelly train that runs very seldom and always at just the wrong time. And the roads are always bad just when you want to go by automobile, having missed the train.

The next time such a trip makes you downright disgusted with life: - Imagine yourself "hopping over" in an hour or two, leaving when most convenient, and enjoying an invigorating sight-seeing trip.

Of course landing fields at both ends are required, but we must wake up to the fact that landing fields are infinitely cheaper, and are of proportionately much more direct advantage to the city in each case, than connecting rail - or auto - roads.

Air travel is coming. It is fundamental that any vehicle which persists material saving in time of transportation must eventually become an economic necessity.

Don't let other towns profit by air travel at your expense simply because your particular town will not prepare for it.

Vote for Your Municipal Landing Field

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DAYTON, OHIO



"The birthplace of the airplane"

CURTISS AVIATION FIELD

MINEOLA, LONG ISLAND, N. Y.

The best equipped flying field in the country
Former U. S. Government Airdrome, Hazelhurst Field
The center of Aviation Activities; one hour from New York

NEWEST TYPES OF CURTISS AEROPLANES,
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WRITE FOR BOOKLET AND RATES.

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GARDEN CITY, LONG ISLAND, N. Y.



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**TRAVEL BY AIR
WITH
AERO LIMITED INC.
ANYWHERE THERE'S AIR AND WATER**
No Stunts or Acrobatic Flying



Seaplane Service to All Points

AERO LIMITED—The Oldest Commercial Air Travellers in America—Has Carried 14,000 Certified Passengers to Date

COMFORTABLE SERVICE DAY OR NIGHT

In any of the flying boats composed in the Aero Limited Fleet you ride in a comfortable seat equally as well appointed as your private car. The seating arrangements in the plane enable you to have a clear view of the earth beneath you at all times.

Over New York - A real sightseeing tour of America's greatest city
New York to Atlantic City Air Service
New York - Newport - Boston - Air Service
New York - Albany Air Line - Lake George - Lake Champlain

The Aero Limited Fleet is manned by officers and crew with a record of long and faithful service. After thorough tests by U. S. Government experts they have been passed by authorities as men of proven worth and ability to fly seaplanes for passenger service.

AERO LIMITED INC.

First aerial passenger routes in America

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Travel by "Air"

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Iota de Pines

DOMESTIC OFFICES
New York
Pine Beach, Boston
Lake George
Hornell, N. Y., New York

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Member of the Audit Bureau of Circulations
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THOMAS-MORSE AIRCRAFT CORPORATION



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THE brilliant performance so characteristic of Wright Aeronautical Engines has made possible much of the new achievements in aeronautics.

This company with its ten year record of uninterrupted service in aeronautical development, is devoted to the single end of identifying its product with all that is constructive in this important industry.

AERONAUTICAL CORPORATION
PATERSON, N. J.



W R I G H T AERONAUTICAL ENGINES

functions of Intranetware Nodes

SE of the most important factors in the advancement of a
commercial aeronautics is the question of insurance
rates. In no aeronautical business, whether it be a
flying school, air transportation, aerial photography or air
work, can insurance be dispensed with for any length of
time. Our own capital is induced to finance aerial enterprises
a large scale, until the question of insurance is satisfactorily
settled.

At present the insurance companies are actually reducing rates, arguing that they have lost money in the business, or in raising of rates cause dissatisfaction all round, and hinders development generally. On business principles, the insurance companies are of course quite right; their premiums should be such as to leave a reasonable profit, and they cannot expect to contribute materially to the remedial action. But is it not possible that a better solution would be not a generalised raising of rates, but a more careful study of each insurance policy written. Certainly, if a plot were pleasure route a single insurance machine is besides unnecessary. If the negligence is poor, if the insurance's skill is small, the territory surrounding the field is poor, the risk is high and the insurance rate should be high accordingly. On the other hand, where a first-class machine, with perfect air and steam generated is operated by a reputable company, much lower insurance rates should be obtainable than are now charged.

Local Air Legislation

THE various laws dealing with air navigation which are in force in several states of the Union as well as county city ordinances concerning the same subject—which are predicted in this issue—make interesting reading and are worthy to be reprinted to many a police.

As might be expected, the American air regulation which follows is of more, that of the town of Koosanen, Fin., contains by far the qualified provisions a point has ever been proposed to fulfill. The flying machine or lighter-than-air which comes within the jurisdiction of that town as opposed to be fitted with "seats, whistles or horns, bells, whistles and other signaling and contrasting apparatus and noise, whistles, flying bells and artificial wings" and to speak "other safety apparatus" which the government may prescribe. For "what the ordinance fails to specify, as the nature of the flying bells and artificial wings." All aircrafts which the ordinance terms "airships" are subject to an annual license tax which works on a sliding scale from one

is that which makes it unlawful to collide with telegraph telephone poles, it being obviously the assumption that men delight in that sort of scribbling.

While the Kansasite ordinance probably represents the law in the line of ordinance, there are other local or town ordinances which contain peculiar features. For instance, residents located within the limits of Hackett, N. J., call a fine of \$25 for the first offense and for thirty days imprisonment for every subsequent violation. In the Territory of Alaska and in the city of Nome, N. J., operation of a soft drink bar is a offense caused by the federal government, and in order to my that, as the government does not issue permits to drink places, the latter cannot legally fly in or in Newark.

The above samples strikingly illustrate the great need for a prompt enactment of federal air legislation, as urged by Senator Hennings in his address to Congress.

federal regulation of air navigation alone can provide for uniform licensing of pilots and the issue of airworthiness certificates to commercial aircraft throughout the country. At some time it will have to work out the ground organization required by commercial aviation. By providing competent pilots, safe aircraft and the necessary ground organization, federal air regulation will facilitate the development of commercial aviation.

3. Easy Machine®

ONE of the longest, yet most commonly used expressions in aviation is the phrase "a heavy machine". If a pilot states that a machine is heavy, it is thereby demonstrated the suspension has been applied to large and small ones of every type.

would seem useful to analyse what is passively in the mind, when he makes an unfavorable comment of this kind. It may mean that the machine is slow to respond to control, in an unsatisfactory way of setting out this fault. It would better to say, that the machine is slow to take up a task or to head down, or something else in the way of a fault. Or he may mean that the machine has little reserve

pose a machine is flying at an angle of incidence of 6°, crossing speed and a downward gout hits it. The effective angle of incidence is thereby diminished and the machine tendency to drop, when there is reserve power, so that speed can be immediately increased. A highly powered plane will thus meet the gout without any difficulty. A low power plane may have a great deal of power, and yet still be unable to get out of the gout without a great loss of altitude.

pilots would drop the term "sage" and parsimoniously their maps and experience, the designer would be greatly assisted, and the particular airplane under consideration would receive a fairer judgment.

section to incorporate in its report the request for further action in the part of the President which was later urged by Congressmen in the House referred to. There was no motion to include a minority report, or an amendment, given that a minority report would be submitted. Hence the Chairman did not feel justified in considering the memorandum handed to him by Mr. Walder on a minority report. In fact, nothing is stated in the memorandum itself to the effect

that it is a minority report. It does not express any difference from the recommendations contained in the report, but that the majority, given the scope of the report, urged that the President re-apply the National Defense Commission for the purpose of making another investigation and sending a report to the President containing definite recommendations in the relative merits of a department of the Air, a United Air Service, and an independent Air Force."

Secretary Denby Launches Merchant Seaplane

Navy Head Anxious to Stimulate Commercial Aviation by the Use of Navy Seaplanes Converted into Commercial Carriers

The first of a series of naval flying boats converted into commercial carriers was launched last week by Secretary of the Navy Denby in the presence of a distinguished audience, comprising Captain W. A. Moffett, Chief of Naval Aviation, members of the Senate and House, the Navy Affairs Committee, and the press. This launching was the first step in an important step to encourage commercial aviation and insures the people with the safety of flying.

14,000 Passengers Carried by Aces Line

Aces Line, Inc., which claims the distinction of being the pioneer in air transport lines in the United States, having been formed in 1919 and having been in continuous operation ever since, has to date carried 14,000 passengers without any accident. This is a highly gratifying record and it has not



SECRETARY DENBY GOING ON BOARD THE AEROMARINE COMMERCIAL FLYING BOAT

Photo U. S. Navy

been equaled either with a cargo or with open cockpits. The power plant is composed of a 400 h.p. Liberty engine, driving a pusher propeller, which gives the machine a maximum speed low down of 76 m.p.h. The overall span of these boats is 72 ft.

In launching these boats, Secretary Denby said that he considered it of very great importance that the public be familiar with the present day safety and the advantages of commercial aviation. Therefore, in order to stimulate interest in commercial aviation, so that we will have trained men available for national defense in case of an emergency, the Navy Department has allowed a limited number of these well-known aircraft to be sold to the public at one-third their actual cost.

It is believed that these interested in aviation and desirous of keeping American commercial aviation ahead of foreign competitors will quickly take advantage of this opportunity to procure equipment of such proven reliability as to assure a future.

After the launching Mr. Denby, together with officials of the

Confederation that air as a transport line which is operated in the most safe and reliable manner and receives any more hazard for passengers than any other form of transportation.

Aces Line currently operates 60 boats. It has 150 seaplanes made of converted B-52 Navy flying boats fitted with the Liberty 32 engine. During the winter months the machines are used for a transport service between Miami, Fla., the Southern headquarters of the company, and Tampa and Miami. S.W. Signal Rights are also made on request to members of the Aeromarine. When the Aeromarine is in the Apalachicola River and south on the coast of New York in sightseeing work, with special trips to Atlantic City, Newark, Boston, etc. One of the boats of Aces Line holds the record for the longest flight between Miami and New York, the total elapsed time being 16 hrs. 35 mins.

On completion of the tour of the company will be opened at the Gothic Room, Buddington, New York, beginning about May 15th. Other air and ground operations of Aeromarine are besides located at Havana, Cuba, Miami and Boston. S.W. Signal Rights of Pensacola, New York; Boston; Lake George, Newark, R. I.; Palm Beach and Miami, Fla.

Aces Line recently acquired exclusive control of United Air Lines of America.



CAPT. W. A. MOFFETT, EXECUTIVE OF NAVAL AVIATION, AND SECRETARY OF THE NAVY DENBY
Photo U. S. Navy

are equipped either with a cabin or with open cockpits. The power plant is composed of a 400 h.p. Liberty engine, driving a pusher propeller, which gives the machine a maximum speed low down of 76 m.p.h. The overall span of these boats is 72 ft.

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State and Local Air Laws and Ordinances

The following are abstracts of the laws dealing with air navigation as present in force in States and Municipalities of the United States and Territories —

State of Connecticut, Massachusetts, New York, Kansas, Town of Newark, N. J., Somers, Fla., City of Newark, N. J., Atlantic City, N. J., New York, N. Y., County of Los Angeles, Territory of Hawaii

STATE OF CONNECTICUT

June 8, 1931

Registration of aircraft. Owner files annually with Secretary of State his name, residence and address and description of such aircraft. Secretary of State will issue distinguishing number and certificate of registration. Certificate to be issued at all times on the aircraft.

Fee: \$5.00

Transfer of Machine. Upon transfer, registration, engine, former owner to whom Secretary of State of transfer and return certificate.

Moderator. Display in concession place pilot bearing moderator composed, in letters and less than 5 ft. in height.

Registration. Secretary of State may suspend or revoke for any cause or may deny certificate for any cause.

Licensing of Operator. Operator must be 21 years old and obtain license from Secretary of State, except to operate over property owned or leased by him or over property of others where permission from owner has been granted him. License granted after examination in manner determined by Secretary of State, or by application for certificate from recognized examiner.

Underwater Operator. Over 18 may operate in company of licensed pilot. Number assigned each license. License must be carried at all times.

Fee. For examination, each year as Secretary of State may require up to \$50.00. For license, \$5.00.

Registration. Secretary of State may suspend or revoke for any cause or may deny certificate.

Inspection. May operate 18 days of house state laws supplied with.

Pilotage. Failure to comply with any provisions may result in fine not more than \$100 or 6 months imprisonment, or both.

Responsibility for damage. Pilot responsible for all damage inflicted by any person. If agent or employee, the principal or employer is liable.

Penalties. "Aircraft" — any flying vehicle.

"Aeronaut" — any person who undertakes to fly in aircraft.

"Fly" — every kind of locomotion by air.

"Landing" — to alight in aircraft.

"Take off" — to ascend in aircraft.

"Tether" — to restrain aircraft by cable.

"Towing" — to move aircraft by cable.

"Underwater" — to move aircraft by cable.

"Underwater Operator" — to operate aircraft in water.

"Underwater Pilot" — to pilot aircraft in water.

"Underwater Vehicle" — to move aircraft in water.

"Underwater Flying" — to fly aircraft in water.

"Underwater Landing" — to alight aircraft in water.

"Underwater Take off" — to ascend aircraft in water.

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KIRKHAMMER, FLORIDA.
July 17, 1930

Registration of machine. No provision, but permission of Council must be obtained for the maintenance of "workshop" shed, barn, garage, station, depot, etc.

For Annual license tax, \$100 for each place of business, as shown. Annual license tax imposed on all aircraft kept, or used for hire, graded as follows: "Balloon, stationary, \$200; powerless, \$30-00; dirigible, \$50-00; Aeroplane, \$100; Helicopter, \$100; Glider, \$100; Airship, \$100; all other types, \$50-00; 10 per cent for 5 to 10 passengers, 20 per cent for 10 to 20, 35 per cent for 20 to 40 passengers, 50 per cent for 40 to 100 passengers, 100 per cent for 100 to 200, 200 per cent for 200 to 300, and 300 per cent for 300 and over." No bar or service freight taxes for term of 3 years.

Provision. Not more than \$500 or imprisonment as "the true value" of the aircraft, for more than 90 days, or both.

Maximum altitude. 100 ft. or less, at a speed greater than 8 mi. per hr., or within 50 ft. at 10 or over 8 mi. per hr., or within 200 ft. at 20 or over 9 mi. per hr., or within 300 ft. at more than 50 mi. per hr., or within 500 ft. at 100 mi. per hr.

Lights and instruments. "All kinds balloons or dirigibles shall be properly equipped with and shall use such lights, whistles or horns, brackets, lights and other signaling and controlling apparatus, and radio, passometers, flying bells and artificial wings and other safety appendages," as prescribed by the U. S. Government.

Miscellaneous. Unlawful in deep articles, or collide with telegraph and telephone poles, etc.

NEWARK, NEW JERSEY
May 19, 1930

Licenses of Operator. Operator must have a license issued by U. S. Corp.

Provision. \$100 first offense, \$250, subsequently.

Miscellaneous. \$300 \$100, except in starting or alighting aircraft, or landing aircraft, or both.

Lights and instruments. Lights, fans and sift, carry maps of routes, compass, landing forms which latter shall be used for starting or alighting at night.

Miscellaneous. Unlawful to drop any article. Unlawful to distribute circulars except on obtaining license for purpose from the Dept. of Public Safety; fee \$50 and bond \$1000. Registration fees on all aircraft, except lawful except on obtaining license from Dept. of Public Safety.

Provision. Unlawful to drop any article. Distribution circulars permitted except on permit from Director of Public Safety.

Miscellaneous. Unlawful to operate to distract peace and quiet and to drop any article. Distribution circulars permitted except on permit from Director of Public Safety.

Provision. Unlawful to drop any article. Distribution circulars permitted except on permit from Director of Public Safety.

Miscellaneous. Unlawful to drop any article. Distribution circulars permitted except on permit from Director of Public Safety.

Provision. \$50 or not more than one year's suspension, or both.

Miscellaneous. 3,000 ft., except at beginning or end of flight.

Provision. "Aircraft" includes any flying apparatus, engine, or part thereof, which is undertaken to direct movement of the machine, "flight" includes any kind of locomotion by aircraft.

E. R. Morton Joins Fairchild Co.

The Fairchild Aircraft Co., Inc., has recently merged its services of E. R. Morton as Technical and Research Engineer. Mr. Morton was formerly retained by the Bureau and Research Department of the United States Air Service of the Department of War, Washington, D. C., Langley Field, Virginia. He is given credit for developing the technique of using aneroid sensors and for extensive experimental work leading to the accurate design of surface pressure monitoring. The results of his work and his concern were the important results of his work and when tested at Langley Field, he determined the practical proof of the theory.

Provision. May follow arrest three times in 60 days followed by conviction, or upon two arrests or 60 days followed by conviction for violation of various regulations. Registration of license for 30 days may follow violation of other provisions.

Provision. Not over 20 days in jail or not more than \$500 or both, for first offense, or imprisonment not over 60 days.

for second offense, and not over six months for third or subsequent.

Miscellaneous. 300 ft., except in starting or alighting aircraft. Unlawful to conduct any aircraft in a manner which endangers the safety of any person or property or members of the aircraft. Unlawful to fly 300 ft. or higher than 1000 ft. above the ground or any land or water having obstacles within 5000 ft. of any landing place or takeoff point. Free balloons have right of way over all aircraft. Aircrafts with definite rates of the air embodied in the technique as required. Dropping of balloon intact when first and graduated.

Provision. The word "aircraft" encompasses all classes of aerial locomotion, including balloons, aircraft, balloons, dirigibles, aircraft, flying boats, aircraft having wings, and aircrafts of any type. "Flight" is defined as 100 ft. or less for 5 to 10 passengers, 200 per cent for 10 to 20, 35 per cent for 20 to 40 passengers, 50 per cent for 40 to 100 passengers, 100 per cent for 100 to 200, 200 per cent for 200 to 300, and 300 per cent for 300 and over. "No bar or service freight taxes for term of 3 years.

Provision. Not more than \$500 or imprisonment as "the true value" of the aircraft, for more than 90 days, or both.

Maximum altitude. 100 ft. or less, at a speed greater than 8 mi. per hr., or within 50 ft. at 10 or over 8 mi. per hr., or within 200 ft. at 20 or over 9 mi. per hr., or within 300 ft. at more than 50 mi. per hr., or within 500 ft. at 100 mi. per hr.

Lights and instruments. "All kinds balloons or dirigibles shall be properly equipped with and shall use such lights, whistles or horns, brackets, lights and other signaling and controlling apparatus, and radio, passometers, flying bells and artificial wings and other safety appendages," as prescribed by the U. S. Government.

Miscellaneous. Unlawful in deep articles, or collide with telegraph and telephone poles, etc.

ATLANTIC CITY, NEW JERSEY
June 24, 1930

Provision. Not more than \$500, except operator must provide satisfactory proof to Director of Public Safety that machine is fit for purpose.

Licenses of operator. Shall have certificate of Aero Club of America or U. S. Government Bureau.

Provision. \$500 for first offense, \$250 for each offense.

Lights and instruments. Light, sift, map of routes, compass and landing forms, which latter shall be used for landing or alighting at night. Exhibitor flight unlawful except on permit from Director of Public Safety.

Miscellaneous. Unlawful to operate to distract peace and quiet and to drop any article. Distribution circulars permitted except on permit from Director of Public Safety.

Provision. Unlawful to drop any article. Distribution circulars permitted except on permit from Director of Public Safety.

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Provision. \$50 or not more than one year's suspension, or both.

Miscellaneous. 3,000 ft., except at beginning or end of flight.

Provision. "Aircraft" includes any flying apparatus, engine, or part thereof, which is undertaken to direct movement of the machine, "flight" includes any kind of locomotion by aircraft.

CITY OF NEW YORK
Feb. 23, 1932

Miscellaneous. Unlawful to drop any articles, including balloons, except over place established for the purpose. For balloon to give any demonstration involving aerostatic machines when they are used to divert attention from aerial flight.

Provision. \$500 or not more than one year's suspension, or both.

Miscellaneous. 3,000 ft., except at beginning or end of flight.

Provision. "Aircraft" includes any flying apparatus, engine, or part thereof, which is undertaken to direct movement of the machine, "flight" includes any kind of locomotion by aircraft.

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"Who's Who in American Aeronautics"

(Copyright, 1930, by the author, Wright Co., Inc.)

Every week, AVIATION AND AIRCRAFT JOURNAL prints the biographical sketch of men who are prominent as American Aeronautics. These sketches will be published later in pamphlet form, so as many of the officers change their stations often, it is believed that a semi-annual issue will be necessary. In compilations of this character, many errors and omissions occur. It will be appreciated if corrections are sent to "Who's Who" Editor.

Charles De Forest Chandler

MAJOR CHARLES DE FOREST CHANDLER, formerly Captain of the U. S. Cavalry, was born June 10, 1875, at New York City, son of Francis M. Chandler and Mary (Stone) Chandler. Was educated at Princeton University, Princeton, N. J., and at the U. S. Cavalry School, Fort Riley, Kansas.

Commissioned in 1898. Served in the Spanish-American War, 1898-1899. Attended the Cavalry School, Fort Riley, Kansas, 1900-1901. Attended the Cavalry School, Fort Riley, Kansas, 1901-1902. Attended the Cavalry School, Fort Riley, Kansas, 1902-1903. Attended the Cavalry School, Fort Riley, Kansas, 1903-1904. Attended the Cavalry School, Fort Riley, Kansas, 1904-1905. Attended the Cavalry School, Fort Riley, Kansas, 1905-1906. Attended the Cavalry School, Fort Riley, Kansas, 1906-1907. Attended the Cavalry School, Fort Riley, Kansas, 1907-1908. Attended the Cavalry School, Fort Riley, Kansas, 1908-1909. Attended the Cavalry School, Fort Riley, Kansas, 1909-1910. Attended the Cavalry School, Fort Riley, Kansas, 1910-1911. Attended the Cavalry School, Fort Riley, Kansas, 1911-1912. Attended the Cavalry School, Fort Riley, Kansas, 1912-1913. Attended the Cavalry School, Fort Riley, Kansas, 1913-1914. Attended the Cavalry School, Fort Riley, Kansas, 1914-1915. 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British Air Power and Air Policy

Analysis of British Air Appropriations, 1921-1922

* Prepared by Manufacturers Aircraft Association

Organizations

The Royal Air Force of Great Britain is a distinct and separate establishment, under a Minister. Since 1919 it happens that the Rt. Hon. Winston Spencer Churchill held the portfolio of both War and Air, extreme dissatisfaction resulting therefrom. It was conceded by many that the Army was then favored. It was contended by many on aeronautics, in Parliament, and by a large body of the press, that this was due to the fact that the Royal Air Force was only a military service organization at the expense of aerial flying.

Within the last month Mr. Churchill relinquished the War portfolio for the Colonial, proposing, at the same time, to retain that of the Air. This, however, invited vigorous protest and the subject was debated in the House of Commons on March, when the Air Estimates for 1921-22 were presented. Appropriation estimates are regarded as final. Therefore the statement in the minutes of the House of Commons, in the debate then, that "the F.O.B. the Royal Air Force," the Air's difference lay in evidence of what Churchill's political enemies represented as loss in favor of strictly military retaliation in the disadvantage of aerial aviation. The point to always bear in mind is in order to appreciate fully the following facts:

1. Great Britain has a Separate Air Department.

It is under the direction of a Minister who is a member of the Cabinet.

2. Great Britain has an Air Policy.

3. Great Britain has an aerial law and adequate machinery for enforcing it.

The Air Estimates debate resulted in victory for those critics who, according the wisdom of service increases, nevertheless demanded that greater attention should be given the development of the aerial arm of their Army. They were successful in the Foreign Guards, and a number of particular provisions for aerial aeronautics were made. Secretary of State for Air. The British Air Minister thus attains the independent status for which it was originally intended.

Appropriations

The Air Estimates for 1921-22 called for a total expenditure of \$10,667,061, or approximately \$95,000,000 at the normal rate of exchange. At the time of the debate on March 20, 1921, the evidence of those serving in India was presented. Accordingly the appropriation estimates the following figures were:

Pay	\$1,600,000
Quarantine, Stores (except Technical), Supplies and Transport	2,125,000
Torpedo and Warfare Stores (Aircraft and Engine Construction)	4,650,000
Works, Buildings, Land	5,640,000
Air Ministry	1,000,000
Civil Aviation	1,000,000
Expenses and Research Services	1,825,000

The following include certain small sums received from previous appropriations, which account for variances in totals.

Of the \$10,667,061 for technical and warlike stores, it is provided that \$1,615,000 shall be spent for aircraft and engines.

Of the \$25,500 for the Air Ministry, £10,181 goes to the Department of the Controller General of Civil Aviation and to the Meteorological Office. The Controller General of Civil Aviation draws £10,000 a year compensation. The controller is Major General for F. H. Sykes, one of the original men associated with the Air Ministry.

Included in the Civil Aviation establishment is £74,600 for the great air ports, wireless stations, scoring nests, etc. at Croydon, Ruislip, Leyton and Fulham.

On the other hand the Royal Air Force establishment is £74,600 for

£200,000 is provided for the dissemination of weather reports. Meteorological stations are actually maintained at twelve-eight (28) points, within and without the British Isles. The sum of £95,000 is included for Schools to British universities several operating companies, the Royal Flying Corps and Research Services, £100,000 for salaries and wages, £244,000 for the Royal Aircraft Establishment at Farnborough, and £140,000 for the Royal Airship Works at Cardington.

Following is an part Mr. Churchill's statement in Parliament on the Air Estimates —

Mr. Churchill's Address

***** I passed not two years ago that, quite apart from clearing away the gigantic tasks and enormous stores of material which the War had left, and which had to be disposed in one way or other, it would take in my opinion five years to make an efficient, self-respecting, well-disciplined, adequately-organized Air Force. About eighteen months of these five years have now gone, and the progress has been excellent, probably partly by the fact that during the whole period we have had continuity of administration. There has been no slipping and changing either of men or of plan, for as the Royal Air Force is concerned. Everything is being carried out step by step as intended. Every senior officer or official is passing his work with a sense of being accountable, and every man is doing his best for the sake of the other men, and probably the year after.

***** There are few people who have any idea of the complexity of the organization of an Air Force. There are, for instance, no less than fifty-four trades, of which thirty are highly-skilled trades, involved in the production and in the repair of an airplane. That gives an idea of the complexity of the organization of an Air Force. They are not necessarily from the technical point of view, but every one of these trades, and every kind of work, is involved in aeronautical research. The whole of this extraordinary complicated material side of aviation, almost without exception, is a technical organization, is now brought into contact with an entirely separate set of complications, namely, all those things from the art of man, almost infinite in their scope and variety, and all the unhappy war considerations upon the aeronautical side of the question. The Royal Air Force, the Army and the Navy, each of whom has its own separate and quite complex proportion of an efficient Royal Air Force. The Navy and Army can each supply a large number of seaplane and land plane squadrons, each requiring a special type of machine, each requiring a specially trained pilot, which they demand to have fulfilled by them by the Royal Air Force.

For instance, machines are required for the Navy to span the line of shot and shell at 100 yards which are extremely numerous. Large machines are also required to attack the heavy ships of the enemy on their battles and at sea with torpedoes and bombs and thus complete with the torpedo boat destroyers which have hitherto so largely won the war. Large flying machines, which are required for the carrying power are required to fly from the deck of ships and afterwards to alight upon them again, in order to attack the torpedo carrying, bomb carrying and reconnoitering machines with which you are bound to sustain a modern battle fleet will be required.

With the Army the types are already well known. You have got to have machines to meet for the wireless stations, for the wireless stations, for the wireless stations, to fight with the infantry, the armored machines, which come very low down in the list, as they did in the last War, the machines which are peculiar to aviation. There are a whole set of technical problems peculiar to aviation, which comprise the effects on the

at short distances or at a great distance, the machines which are to fight the airships of the enemy of different types on the sea, and so onward not only all year over airships but the regular services of the Army. Everyone of these various applications of air power requires a special type of machine, and the special training of the men to use them. The Royal Flying Corps is an integral, efficient, military unit, you cannot afford to be ignorant of any of these details or incapable of performing them. It is difficult to make an officer, to train men for the responsibility and bearing which are given to us. It is difficult to make a pilot, to ensure that extraordinary facility in the conduct of the machine in the air, but in the Royal Air Force, when you have trained a man both to be an officer and to be a pilot trained in the aircraft, you have a complete man. The aircraft, these you are not given to any man at the end. The pilot, with all his skill in flying, with all his knowledge of his machine, would be a mere prey to an enemy unless he could, in addition, fulfil at least one of the highly specialized functions of aerial war, gunnery, bombing, signaling, photography, wireless telegraphy, spottings for artillery, observing, and other functions of that kind. Our organization now therefore provides for a large number of various technical training schools, and that is what is being done steadily building up in different parts of the country, according to our scheme, in the last eighteen months.

R.A.F. General Establishments

"Now I will tell the House about some of these establishments, because it is necessary that they should realize the complexity of the Air Service, compared with the Army, or even with the Navy itself. At Farnborough we are going to train 3,000 boys to be skilled mechanics, with an eventual output of 3,000 a year, and here and there Maestros, skilled recruits are now undergoing an intensive course of technical training. At Croydon we are training soldiers to be officers, and simultaneously to a large number of the boy recruits to be airmen. They are to be instructed in flying, and officers are also given a course of practical engineering. At Netheravon and five other training schools, one of which will be in Egypt, we are training officers to become highly skilled pilots, not mechanics, but pilots. At Andover a school will be opened to teach us mechanics and night flying. Andover will be a night school, where we will have, aerial gunnery, aerial navigation, and so on taught. At Duxford, these boys are taught, dropping from aircraft, and mechanics are being conducted to improve the methods of observation for naval guns, and the wireless control of aircraft, that is to say, of self-propelled, vessels which move without way so as to pass through the sea and are directed in their movements by an airplane in the air with wireless. At Farnborough there is an electrical and wireless school. I would say that each of the schools, which are now established in the field of technical, aeronautical, mechanical, electrical, and wireless training under one roof, which has its relation to the general purpose we have in hand. At Larkhill, technical training is undertaken. At Farnborough, photography as all the time, that is to say, the taking of photographs, the reproduction of photographs rapidly, the understanding and reading of photographs, and the detection of the meaning of photographs taken from the air—the wisdom of science in short, which would, I am certain, fascinate any Member who had time to go and see what we are doing.

"At Andover is the Air Force Hospital, and there we have a physical training school. As an ordinary and Farnborough service and infantry corpsmen are brought to work with the negligence of these two other Forces. At Croydon, an organization over the sea, long-range flights by the staff by other methods, and seaplane flying. At Farnborough, and Larkhill, in Scotland, we stations where the cooperation of the Navy is carried on. There are there the great experimental stations at Martlesham, Gosport, and Duxford Hill. There are at Farnborough, and Farnborough, an electrical laboratory, and a wireless station for the general development of flying. There is a research laboratory with schools for medical officers at Holly Hill, to enable them to study the medical problems which are peculiar to aviation. There are a whole set of medical problems peculiar to aviation, which comprise the effects on the

body being of the different altitudes, and an entire study of the kind of tests to which recruits and would-be pilots are subjected before you can be sure they will stand the particular strain to which they will be subjected without risking their lives and the lives of other dependents. At Larkhill, there is a wireless station, and there which have been established at Cambridge, Oxford, London, Croydon and Sheffield at the great universities in these cities. These courses deal, first, with the theories underlying aviation, and secondly, they provide specialized engineering instruction.

"I have outlined the whole of this picture to the House, because every part of this complicated organization is very largely interdependent. Like the organs of the human body, all are necessary for healthy life. I wonder how many of the members of the House have any knowledge of the organization of the Air Service. Sometimes I think they are, because there are so many that the first effect of knowledge is to sweep the style. Our organization has now been carried in a place where its entire scope can be discerned. It is still very new; it will only exist the rest of the five years to complete it, but, at any rate, it is all block in, and you can see an actual working picture of what the Royal Air Force is. I consider that what an organization is, is to say, an organization which is an educational system, for acquiring practical skill and scientific knowledge to young British boys of every rank and class in life which has been called into being in this country, as far as I know, in any other. Leaving war purposes out altogether, leaving the idea of war and the military application of the science out altogether, we can be sure that the combination and creation of nations, and the development of the colonies, the advancement and development of the Royal Air Force is a great national asset, and an asset which, let me put it out, is shared by all classes.

"This whole system, with all its complicated establishments, has just been laboriously brought into being and is just beginning to work as a whole, and, of course, it has just started the point in its development where it would be possible to do the greatest amount of harm in the shortest possible time. When one looks at it as one sees it now, one cannot help saying to one's self, what an irresistible temptation this must offer to ignorant destructionism.

R.A.F. Air Service Squadrains

"Upon the foundation which I have described if these training establishments are mentioned the fighting squadrons upon which we are aiming to keep pace and stride throughout the Empire and to preserve for us the means of defense at home. Without a complete training organization you cannot have any efficient force of air squadrons; once you have got that organization it will carry a few more or a few less, with any particular movement, but it will carry a few more. There are 22 flying squadrons, and a wireless complement of which there are 12 in Palestine, five in Mesopotamia, eight in India, one in Egypt, one in China, one at Madras, the last not yet fully equipped; thus 37 out of the 38 squadrons are overseas. The equivalent of these three more squadrons in Ireland, those are working with the Navy, while one is employed at home in giving refresher courses to pilots. The four additional squadrons which are the residue of the five mentioned in the House during the meeting, will be brought up to 32. At present that brings our total up to 32. These additional squadrons are wanted in Egypt, Mesopotamia. They constitute the only reserve for all contingencies that we possess in the flying service. These fighting squadrons and training establishments comprise 2,000 officers, about 25,000 men, with a certain number of civil assistants. That is the Air Force upon which, rightly or wrongly we have been basing for the last two years.

"I think there is a possibility in the future of a higher degree of economy being effected in the organization, but I do not know how. I do not know how to shorten the work of the training establishments. But we have not yet been able to do that. Indeed, really, the squadrons have themselves been forming and, indeed, because all these squadrons have been engaged in aerial fighting, or in operations which have many of the important elements of aerial fighting, during the course of the last twelve months. In addition, we propose this year to begin the formation on a very small scale of a territorial

Air Force, for which £20,000 is taken in the Estimate. Our idea is to have six squadrons stationed over Britain, where there is a large engineering population, and where aerodromes are available. Each squadron would have a small variety of regular air machines, and it is hoped that the skilled voluntary element in the neighbourhood will form this small nucleus.

**** I am very anxious to abstain to the best of my knowledge and wisdom, it would be of no use to take advice which is presented to me, and I am sure that the majority of the Air Force would be of the same opinion. At present the best war is the war to end all war, and has it not ended by leaving each a friend toward one another among all the nations of the world, among all individuals of every class in every part of the world that all idea of violence is entirely消灭ed from human affairs? Has it not put an end to all international hostility, and is it not good to go into disarmament? Has not our Home Secretary said that we must have a minimum of armament which could suffice to repel any attack upon our country? and so on. He also said, "What do we want all this service aviation for? Instead of this let us go in for some splendid new development of civil aviation. Let us take seven or eight millions from the Royal Air Force and devote them to the pursuit of marine airmen and airmen all over the country, and let us have the Air Force left out for a moment. What are not the good objects in this? Let us have a good money for them, but when it comes to putting up some aerodromes in order to provide what, after all, at their best are conveniences, surely we should be considering a very great

Fostering Civilian Aviation

**** The task of fostering civilian aviation in the British Isles will be simplified by the fact that the weather conditions and other climatic conditions are a terrible hindrance. Moreover, the country is covered by a network of railways and roads, which constitute a most formidable competition with the air. Travelling by air does not mean travelling from one city to another, but from one neighbourhood to another, the aerodromes are on the outskirts of the cities, and it usually takes four flights to these aerodromes to get to our resorts or sea-ports.

There have been accidents in the air, but with very few, which carry passengers into the heart of the ocean, and which occur every time they take them directly from door to door. If you add to that the danger and uncertainty induced by climatic conditions, it will be seen that we are much less favourably circumstanced, as far as domestic air travel is concerned, than, say, like France, Italy, Spain, or, I dare say, the United States of America. Therefore, I should not expect to see a very large or a very rapid development of air travel in this country within these years. I think the development might easily prove not very large, save of course, with that stage, without achieving any permanent result. There is, however, one route which we should keep open, and which certainly offers superior prospects of success. I mean the one route from London to Berlin and the Continent generally. Here the British attitude should be taken by the wireless controllers. Our wireless controllers, from the moment that they are most reasonably kept to leave on a line of cleaving, of crossing the Channel with no attendant delays and difficulties.

The Chancellor of the Exchequer has accorded to the Air Ministry a very wide discretionary power in the spending of £1,000,000,000 to be used at my discretion, in which scheme the revenue forecast on the £20,000,000. The sum of £80,000 is included in the Estimate for expenditure in aid of armed forces, and this was based on a scheme proposed by Lord Wedes's Committee for sale during some months to the extent of 10 per cent of their gross earnings.

Now, however, that the French Government have decided to increase the amount of their military air force, and I fear that if we adhere to the scheme of Lord Wedes, the entire one sum will be so heavily absorbed that there will be no encouragement for British firms to continue. I propose, therefore, to set up immediately a Committee, including members of the aircraft industry and the aerial transport firms, to devise the necessary alternative methods which will meet these changed conditions, and to make proposals for consideration

action. If a swing can be effected on other parts of the civil aviation, then, the underwriters we now offer will be made much greater. More than that I cannot say at present.

It is hard to deal with at least one further question. We are often asked, is the Air Force to be simply an addition to the pre-war Army, or is it gradually to become a substitute for it? For instance, "Is not the war over, and is not the best war the war to end all war, and has it not ended by leaving each a friend toward one another among all the nations of the world, among all individuals of every class in every part of the world that all idea of violence is entirely消灭ed from human affairs?" Has it not put an end to all international hostility, and is it not good to go into disarmament? Has not our Home Secretary said that we must have a minimum of armament which could suffice to repel any attack upon our country? and so on. He also said, "What do we want all this service aviation for? Instead of this let us go in for some splendid new development of civil aviation. Let us take seven or eight millions from the Royal Air Force and devote them to the pursuit of marine airmen and airmen all over the country, and let us have the Air Force left out for a moment. What are not the good objects in this? Let us have a good money for them, but when it comes to putting up some aerodromes in order to provide what, after all, at their best are conveniences, surely we should be considering a very great

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Possibilities of the Torpedoplane

**** That is as far as we have gone at the present time but I am not bound to decide that unless another few years pass we shall have ariplanes carrying torpedoes. We have £200,000 for the guns being made today capable of lifting a torpedoplane ariplane at the rate. This is called very little kind in the possibilities of attack by torpedoplane ariplane on tankships of the line. I realize, of course, that our Navy will make efforts, as in the past, to encounter all that. But just as well as a tankship the destroyers will be able to intercept ariplanes carrying torpedoes and these would have to be armed with 1000 destroyers and these would have to be armed with 1000 destroyers at the Battle of Jutland. A destroyer costs £500,000. A torpedo-carrying machine costs from £50,000 to £70,000, and one would have about as many torpedoplane ariplanes as he liked. In the 100 destroyers we had at Jutland, we might have several thousand torpedoplane ariplanes. What would be the cost of the German fleet when they were armed with torpedoes? The cost of these would be £100,000 each. If one destroyer they had been armed by £6000 or £7000 torpedoplane ariplane? Assume, for a moment, that one half of the ariplanes were shot down. I venture to say that the remaining ariplanes, flying at the rate of 140 miles an hour would have made short work of the German Fleet. Of course there would have to be steps to carry the ariplanes, but we know that are magnificent vessels to fit. The Royal Navy would get these from their own ariplanes, which will get off and get back from their own bases, and it is quite possible that there will be steps in the future capable of carrying from 50 to 100 of these ariplanes. Pictures have been published showing the enormous decks from which these ariplanes will go off. But I would give an illustration showing how these torpedoplane ariplanes could be used without any necessity for having carrying ships. We had several made on the East Coast by ships of the German Navy during the War. These ships were of these rates, got away quite unobserved after having been loaded with torpedoes, and then disappeared in our coast towns. It would be possible to give these ships a tow and a half hours start and then send a squadron or two of these swift flying torpedoplane ariplanes which could intercept them as long as a half. The distance would be well within their radius and having disabled these torpedoes they could get safely back again.

**** I think I am right in saying that the present Air Minister is now obsolete, or if it is not so today it certainly will be by the end of this year. That at any rate is the view of most of our experts, and it is distinctly the view of the American Air Service.

Two years ago an International Trade Association was formed at the Hague, and the chair was taken by General Sir

Sefton Brumster, one of our foremost flying officers. Last month the Association met in Berlin, and the chairman taken by a General. The English members are of the opinion of Norway, Sweden, Denmark and Holland are not willing to come in with Great Britain, to back up their air armament with ours, and to take their machines from our manufacturers. The whole of that is lost and gone, and before very long—possibly that year—Fokker, whose machines we used to know something about during the War, and who has now devoted himself to the continental side, will be making a "Fokker" aircraft in Germany. The first thought that comes to my mind is that we will not allow him to do it. But I am afraid we must, because, as we are, on our mind, it is essential to us that we should retain the freedom of the air over foreign countries. It is no use our saying to any foreign country, "You can not use a service over England because the naval reply would be, 'Very well, you keep to your own island, you shall not use an English service over us.' That is to say, to our future in the air we should return by agreement to a foreign force, and lose the right of keeping our services across there.

During the War we used over and over again that the essential of an Air Service is that you should keep your forces in existence. You cannot sustain forces by the way of a magazine's word. You cannot get back the damage and staff necessary for making machines or air engines. You must have your own power. Our own have done a stupendous job. Now, the English are in a position to do it. They have practically stopped doing our work. **SUPERIOR WEIGH BROKEN UP NINE FEW MONTHS AGO, AND EIGHT OF THREE BEST MEN, INCLUDING THE CHIEF DIRECTOR AND THE ASSISTANT AND WORKS MANAGER HAVE BEEN TAKEN OVER BY JAPAN THEY HAVE GIVEN THEM, AND ARE WORKING FOR THE JAPANESE GOVERNMENT, WHICH, IT MAY SAY, IS SPENDING FAR MORE MONEY ON AVIATION THAN WE ARE."**

Personnel of the Royal Air Force

1. AIR COUNCIL

President of the Air Council—The Rt. Hon. Winston Spencer Churchill, M. P., Secretary of State for Air Vice-President of the Air Council—The Rt. Hon. Sir Alexander Herdman, Air Minister; Sir M. G. Trenerry, C. M. G., Chief of the Air Staff; Major-General Sir F. H. Sykes, Controller-General of Civil Aviation; Air Vice-Marshal Sir H. L. Hollings, Director-General of Supply and Research; F. M. Robinson, Esq., Secretary of the Air Ministry; Sir James Stirling, Air Marshal Sir G. F. Lamont.

2. AIR MINISTRY

Secretary of State for Air—The Rt. Hon. W. R. Churchill, M. P., Under-Secretary of State for Air; The Rt. Hon. Sir Alexander Herdman, Secretary of the Air Ministry; W. P. Macmillan, Esq., C. B.

Finance Department
Accounting, Financial Secretary,
Director of Finance for Personnel,
Director of Finance for Material,
Director of Contracts.

Department of Posts (Using Services for War Office, Ministry of Munitions, and Air Ministry),
Director of Posts,
Controller of Posts.

Controller of Land
Chief Valuer and Compensation Officer
Department of the Chief of the Air Staff
Chief of the Air Staff, Air Marshal Sir H. M. Trenerry.

Civil Assistant
Private Secretary
Director of Operations and Intelligence
Director of Training and Organisation
Deputy Director of Training
Director of Personnel
Deputy Director
Director of Equipment, Deputy Director of Equipment.

Municipal Air Port at Hartford, Conn.

Hartford, Conn., has taken a most progressive stand upon air traffic matters. It has an active municipal body known as the Hartford Aviation Commission which, with the Hartford Aero Club and the recently appointed aviation committee of the Connecticut Chamber of Commerce, are definitely engaged in making the city and state prominent in aeronautics.

The Hartford Aviation Commission by acquiring jurisdiction over areas of private property within a mile and a quarter of the river or the river bank of the Connecticut River has established a suspended air port for land and water machines. The Litchfield Field is of sufficient proportions for present-day machines and, since all the adjacent property is open and fairly level, it affords an excellent opportunity for the development which the city has been planning for the past three months. All trees along the river bank have been cut down, so far as the river and government operations have been started, and a workshop building and oil and gas house have already been erected. It is anticipated that the field with seaplanes, oil and gas, telephone connection and a dock for seaplanes will be ready by the middle of May.

On May 22, 1930, the Board of Aldermen of Hartford passed a resolution that the Mayor be authorized to appeal to a commission to be known as the Hartford Aviation Commission to be composed of five citizens to hold office from the 1st day of December, 1930, to the 1st day of April, 1932. The Mayor shall be ex-officio of this Commission. The Commission held its first meeting on Dec. 18, 1930. Its members are Horace Percy Mann, President; Newton C. Bassett, Mayor; Member ex-officio; Samuel A. Major, Treasurer; 284 Park St.; James B. Sherman, Secretary, 61 Elmwood Street; Harttress B. Freeman and Clarence H. Keen. All members of the commission have been connected with flying for several years. The organization of the Aldermen's Meeting, now at 100 Main, was started in 1928 with greater experience, and that of the other members is actual flying experience in recent years.

The promotion of interstate aviation has been undertaken by the Connecticut Chamber of Commerce by the appointment of an aviation committee of which Judge William J. Malone of Bristol is chairman. Other members are Horace Percy Mann of Hartford, Leland W. Parker Soddy and Lawton W. G. Raymond of Bridgeport, and Henry C. Chapman of New London. Another member from New Haven will be named later. The purpose of this committee is to assist in securing the incorporation of Connecticut in the establishment of landing fields of suitable points in connection with the New York to Boston air route. One of the first activities of the Chamber of Commerce aviation committee has been favorable consideration of a project to establish a flying boat passenger line between Springfield and New London with Hartford and Middlefield as way stations, and when weather permits flying direct between New Haven and New London. A trial flight on this route took place on April 15 from the Hartford Yacht Club, when an American Navy E-2E flying boat was despatched from New York with Judge Wm. J. Malone as a passenger.

German Air Traffic Development

The German air transport companies are making good use of the air and sea routes of midwest and other transportation systems in the conduct of their new Eastern airways.

A German company recently opened a regular service with Fokker passengers and freight planes between Berlin, Vienna and Sofia and between Berlin and Warsaw. The first two of these Dutch planes arrived by air from the Fokker factory recently, and other planes made recently at Wiesbaden, each machine carries 12,000 lbs. of freight so the service should prove a useful connection for passengers and export supplies between the centers of Lithuania and Poland and the Baltic ports.

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Training, Special Flights

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SAN FRANCISCO, CALIFORNIA

EARL F. COOPER AIRPLANE & MOTOR CO.

ILLINOIS

CHECKERBOARD AIRPLANE SERVICE
FOREST PARK, ILLINOIS

INDIANA

One of the largest and best equipped flying fields
in the United States

CURTISS-INDIANA COMPANY

Est. 1928, Indiana

All types of CURTISS planes.

LOUISIANA

GULF STATES AIRCRAFT COMPANY
SHREVEPORT, LA.

MASSACHUSETTS

BOSTON AND SPRINGFIELD, MASS.

EASTERN AIRCRAFT CORP.

349 FIRST ST., BOSTON, MASS.

MINNESOTA

MINNEAPOLIS, MINN.

SECURITY AIRCRAFT CO.

FIELD, HANGARS, SHOPS

NEW JERSEY

DEAL AND SPRING LAKE, NEW JERSEY

HANGARS, SHOPS, FIELDS

DE LUKE AIRCRAFT SERVICE, INC.

NEW YORK

PASSENGER FLYING BOATS

NEW YORK AERO LIMITED FLORIDA
GOATHAM BANK BLDG., NEW YORK, N. Y.

NEW YORK

CURTISS AIRDROME

HAZELHURST FIELD, MINEOLA, LONG ISLAND
CURTISS AEROPLANE & MOTOR CORPORATION

OHIO

DAYTON, OHIO.

Belpoint, Miamisburg, Dayton and Field 1 mile from Dayton Road.
JOHNSON AIRPLANE & SUPPLY CO.

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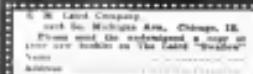
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SPECIFICATIONS

Model	2 Seats	4 Seats
Span	23' 10"	...
Length	33' 0"	...
Height	8' 0"	...
Surface, wings	214 Sq. Ft.	360 Sq. Ft.
Surface, tail	70 Sq. Ft.	110 Sq. Ft.
Weight, empty	900 Lbs.	1200 Lbs.
Weight, max. load	1000 Lbs.	1500 Lbs.
Useful load	500 Lbs.	750 Lbs.
Leading per Sq. Ft.	5 Lbs.	5.5 Lbs.
Leading per H.P.	29.2 Lbs.	36 Lbs.
Maximum speed, air	60 M.P.H.	65 M.P.H.
Minimum speed, landing	8 M.P.H.	10 M.P.H.
Flight duration	4 Hours	4 Hours
Gauge, oil level	800 P. per Min.	800 P. per Min.
Gauge, oil pressure	1000 P. per Min.	1000 P. per Min.
Radius, standard, rated	100 at 1800 R.P.M.	120 at 1800 R.P.M.
Heats, prop.	100 at 1800 R.P.M.	120 at 1800 R.P.M.
Gasoline Consumption	2 Gal. per Hr.	2 Gal. per Hr.
Oil Consumption	1 P. per Hr.	1 Gal. per Hr.
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